SECTION 6.0

AIRSIDE DEMAND CAPACITY ANALYSIS/FACILITY REQUIREMENTS

6.1 INTRODUCTION

The objective of the airside demand/capacity analysis is to determine the capability of existing airport airside facilities to accommodate existing and future aviation demands as quantified by the aviation forecasts developed in Section 5.0, Forecasts of Aviation Demand, of this report. Once the demand/capacity analysis is performed, facility requirements can be determined. This section will describe those additional facilities identified as being required to meet future aviation demands as well as identify a timeframe in which the new facilities need to be implemented. Other facilities recommended based on safety, operating efficiency, or to maintain, restore, and upgrade facilities to current standards will also be described. The Federal Aviation Administration (FAA) Standards for the location, construction, and protection of those facilities are also presented.

6.2 WIND ANALYSIS

6.2.1 Introduction

Local prevailing meteorological conditions such as wind direction, cloud ceiling heights, and visibility have a direct influence on the development of an airport runway system. In a wind analysis, particular care is given to the assessment of the local origin and velocity of prevailing winds, specifically in the determination of the required number and orientation of runways at an airport.

Ideally, any single runway should be aligned with the prevailing winds that, to varying degrees, have a direct affect on all aircraft. Generally, the smaller the aircraft, the more it is affected by the wind, particularly crosswind components. The crosswind component is the resultant vector of the runway direction and existing wind that acts at a right angle to the runway. FAA Advisory Circular (AC) 150/5300-13, Change 5, *Airport Design*, recommends that at least 95 percent crosswind coverage be provided by the runway system (one or more runways) at any airport. If the runway wind coverage is less than 95 percent, an additional runway(s) should be provided, with an orientation such that the combination of all runways provide 95 percent or better wind coverage. The most desirable runway orientation provides the greatest runway wind coverage with the least crosswind component.

6.2.2 Methodology

When surface winds cross the runway at an angle during landing and takeoffs, the wind exerts both headwind and crosswind components upon the aircraft. For operational safety considerations, pilots desire to use runways that, to the greatest extent practicable, offer the greatest headwinds and least crosswinds. Each aircraft (by factory design) has a maximum recommended demonstrated crosswind velocity limit, which is the crosswind component for which adequate control of the airplane was demonstrated during takeoff and landing. As a rule, most airplanes are limited to a crosswind component of 20 percent of the maximum certificated weight stall speed with recommended landing flaps. Runway wind coverage, as used in airport planning, measures the percent of time crosswind components are below maximum acceptable velocity limits.

For purposes of airfield and facility planning, the FAA has established a coding system called an Airport Reference Code (ARC), which represents two components related to the operational demands of aircraft anticipated to utilize the airport. The first component of the coding system is the Aircraft Approach Category, which is a grouping of aircraft that have similar landing approach speed characteristics. The second component is the ADG, which groups aircraft by wingspan. Most often, airport planning considerations are based on pre-established ARCs, which in turn establish airport design criteria. Both components are described in detail in Section 6.7.1.

The overall future planning requirements for the existing runway system at Double Eagle II Airport has an ARC C-III classification, which is associated with a crosswind component of 20 nautical miles per hour (knots). However, for the purposes of analyzing the effective runway wind coverage at Double Eagle II Airport, crosswind components of 10.5 knots and 13 knots (representing an ARC of B-II) were used for Runways 4/22 and 17/35. The lower crosswind components represent the smallest aircraft, and, therefore, most "crosswind-susceptible" aircraft. These aircraft account for the majority of operations at Double Eagle II Airport.

As used in airport planning, runway wind coverage is determined as the relative measure of the percentage of observed and recorded wind direction and wind speed. Using recorded wind data collected over several years, runway wind coverages and resultant crosswind components can be determined. Determining the wind coverage of the existing and proposed runways involved assembling and analyzing specific wind data for different meteorological conditions at Double Eagle II Airport.

6.2.3 <u>Assembling Wind Data</u>

An Automated Weather Observation System (AWOS-3) was installed at Double Eagle II Airport in 2000. The AWOS-3 records a variety of site-specific meteorological data once every 5 minutes, 24 hours per day at the airport. During the period of April 1, 2000 through March 31, 2001, a total of 105,796 AWOS-3 surface observations were recorded and later used as part of the wind analysis. It is recommended that the wind data is supplemented and re-analyzed as additional data becomes available.

6.2.4 Selected Meteorological Conditions

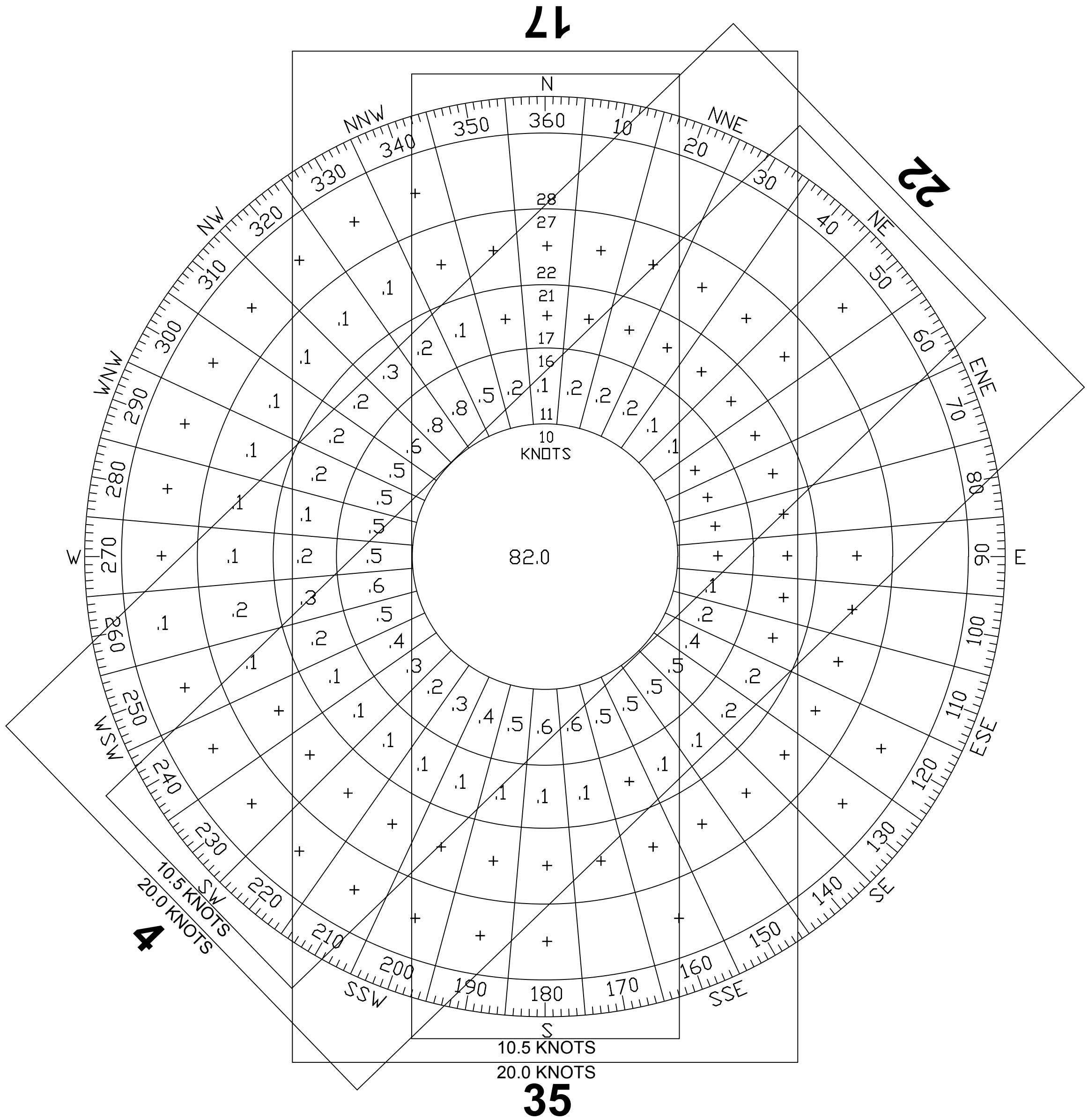
Using current and proposed future airfield instrumentation capabilities, various ceiling height and horizontal visibility scenarios were analyzed. The following meteorological scenarios of cloud ceiling height and horizontal visibility were developed and provided information and guidance for the analysis of the operational impact of winds on the airport's existing runway and proposed runway:

- **All Weather** - All observed ceiling heights and horizontal visibility reported.
- **Visual Meteorological Conditions (VMC)** - Observed conditions when ceiling height was greater than, or equal to, 1,000 feet above ground level (agl) and horizontal visibility was greater than or equal to 3.0 statute miles. Flight operations during these conditions may be conducted under Visual Flight Rules (VFR).
- **Instrument Meteorological Conditions-1 (IMC-1)** - Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than three statute miles but, when ceiling height was greater than or equal to 600 feet agl and horizontal visibility was greater than or equal to two statute miles. Flight operations during these conditions are conducted under Instrument Flight Rules (IFR). These meteorological conditions approximate the minimum published non-precision approach minimums for approach category D aircraft at Double Eagle II Airport using the Instrument Landing System (ILS) or Global Positioning Satellite (GPS) circling approach to Runway 22.
- **Instrument Meteorological Conditions-2 (IMC-2)** – Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than 3.0 statute miles but when ceiling height was greater than or equal to 600 feet agl and horizontal visibility was greater than or equal to 1.5 statute miles. Flight operations during these conditions are conducted under IFR. These meteorological conditions approximate the minimum published non-precision approach minimums for approach category C aircraft at Double Eagle II Airport using the ILS or GPS circling approach to Runway 22.
- **Instrument Meteorological Conditions-3 (IMC-3)** – Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than 3.0 statute miles but when ceiling height was greater than or equal to, 600 feet agl and horizontal visibility was greater than or equal to 1.0 statute mile. Flight operations during these conditions are conducted under IFR. These meteorological conditions approximate the minimum published non-precision approach minimums for approach categories A and B aircraft at Double Eagle II Airport using the ILS or GPS circling approach to Runway 22.
- **Instrument Meteorological Conditions-4 (IMC-4) –** Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than 3.0 statute miles but when ceiling height was greater than or equal to 400 feet agl and horizontal visibility was greater than or equal to 1.0 statute mile. Flight operations during these conditions are conducted under IFR. These meteorological conditions approximate the minimum published non-precision approach minimums for approach category D aircraft at Double Eagle II Airport using the GPS approach to Runway 22.

- **Instrument Meteorological Conditions-5 (IMC-5)** – Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than 3.0 statute miles but when ceiling height was greater than or equal to 400 feet agl and horizontal visibility was greater than or equal to 0.75 statute miles. Flight operations during these conditions are conducted under IFR. These meteorological conditions approximate the minimum published non-precision approach minimums for approach category D aircraft at Double Eagle II Airport using the localizer approach to Runway 22.
- **Instrument Meteorological Conditions-6 (IMC-6)** – Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than 3.0 statute miles but when ceiling height was greater than or equal to 400 feet agl and horizontal visibility was greater than, or equal to 0.5 statute miles. Flight operations during these conditions are conducted under IFR. These meteorological conditions approximate the minimum published non-precision approach minimums for approach categories A, B, and C aircraft at Double Eagle II Airport using the GPS or localizer approach to Runway 22.
- **Instrument Meteorological Conditions-7 (IMC-7)** – Observed conditions when ceiling height was less than 1,000 feet agl and/or horizontal visibility was less than 3.0 statute miles but when ceiling height was greater than or equal to 200 feet agl and horizontal visibility was greater than or equal to 0.5 statute miles. Flight operations during these conditions are conducted under IFR. These are the published approach minimums for the Category I (CAT-I) ILS for Runway 22.
- **Below proposed CAT-I ILS Approach Minimums** – This meteorological condition is below VMC and has an observed ceiling height of less than 200 feet agl and/or horizontal visibility of less than 0.5 miles. When this meteorological condition occurs, aircraft would be unable to land at Double Eagle II Airport since the conditions are below that allowed for the CAT-I ILS approach minimums for Runway 22 at Double Eagle II Airport.

6.2.5 Analyzing Wind Data

Analysis of the AWOS-3 wind tabulation data was performed using the FAA's Microcomputer Airport Design Program Version 4.2. The wind analysis capabilities of the program include calculating the wind coverage of one or more runways and producing a wind rose. The wind rose is a graphical depiction of the relative percentile occurrence of observed winds by origin (relative to true north) and velocity (measured in knots). The affected runway orientations and applicable crosswind component are also depicted as transecting parallel lines. The arithmetical sum of all percentiles within the parallel lines represents the total runway wind coverage for that crosswind component. The FAA, in its determination of acceptable runway wind coverage, prescribes this graphical reference. The Double Eagle II Airport all weather wind rose is shown on Figure 6.1. When measuring runway wind coverage, the most *critically affected* aircraft (aircraft having the smallest crosswind operational limit that will utilize the runway), must be considered. Appendix F contains the wind roses for all other selected meteorological conditions (Figures F.1 through F.9).



NOTES:

This chart plots, for the data period, the recorded occurrences (in percent) of wind by direction and speed while the rectangular boxes represent the maximum acceptable crosswind component for each runway (20 knots for the design aircraft) and the component of the most crosswind-susceptible aircraft (10.5 knots). The wind coverage capacity of the airfield is thus determined by totaling all occurances falling within the rectangles.

Runways are numbered using magnetic headings while wind data is presented using true headings. Therefore, there is approximately a 11 degree difference between the runway headings and the wind rose headings.

Wind Coverage

10.5 knots: 94.55%
20 knots: 99.68%
Total Observations: 105,787

TN MN
11°E
TN = True North
MN = Magnetic North

URS Corporation, 2001

Wind Tabulation Data

Source: AWOS-3
Double Eagle II Airport - Albuquerque, NM
Data Period: April 1, 2000 - March 31, 2001

Wind Rose
FAA Microcomputer Airport Design Program, Version 4.2

DOUBLE EAGLE II AIRPORT

MASTER PLAN UPDATE

ALL WEATHER WIND ROSE

FIGURE 6.1

Based on Airport Master Records (FAA Form 5010-1), the majority of aircraft that have been based at the airport are comprised of light single- and multi-engine aircraft. For determining the aircraft operational fleet mix at the airport, it was estimated that ARC A-I and B-I aircraft generated the predominance of all operations. Therefore, for the purpose of determining the minimum acceptable runway wind coverage, the 10.5-knot crosswind component was applied.

Additional statistical analysis of the wind tabulation data was conducted to produce graphical depictions of predominant wind patterns at Double Eagle II Airport with the 10.5-knot crosswind component. These patterns are denoted in this report as wind persistency charts, which are useful in readily depicting the relative wind origins and velocities as expressed as a percentage of time. The annual all weather wind persistency chart is shown on Figure 6.2. Seasonal winds are depicted in the monthly all weather wind persistency chart shown on Figure 6.3. Appendix F contains the wind persistency charts for all other selected meteorological conditions (Figures F.10 through F.18).

6.2.6 Occurrence of Selected Meteorological Conditions

Based on AWOS-3 data recorded at Double Eagle II Airport for the 12-month period, VMC occur approximately 98 percent of the time. Conditions that are within the existing approach minimums for the airport (IMC-1, IMC-2, IMC-3, IMC-4, IMC-5, and IMC-6) occur less than one percent of the time. The meteorological condition associated with the CAT-I ILS approach to Runway 22, IMC-7, also occurs less than one percent of the time. According to the weather occurrences analyzed, the airport experiences meteorological conditions that are below proposed published CAT-I ILS approach minimums 0.68 percent of the time. Table 6.1 lists the meteorological conditions and percentage of occurrence associated with VMC, each published approach, and below CAT-I ILS minimum conditions.

TABLE 6.1

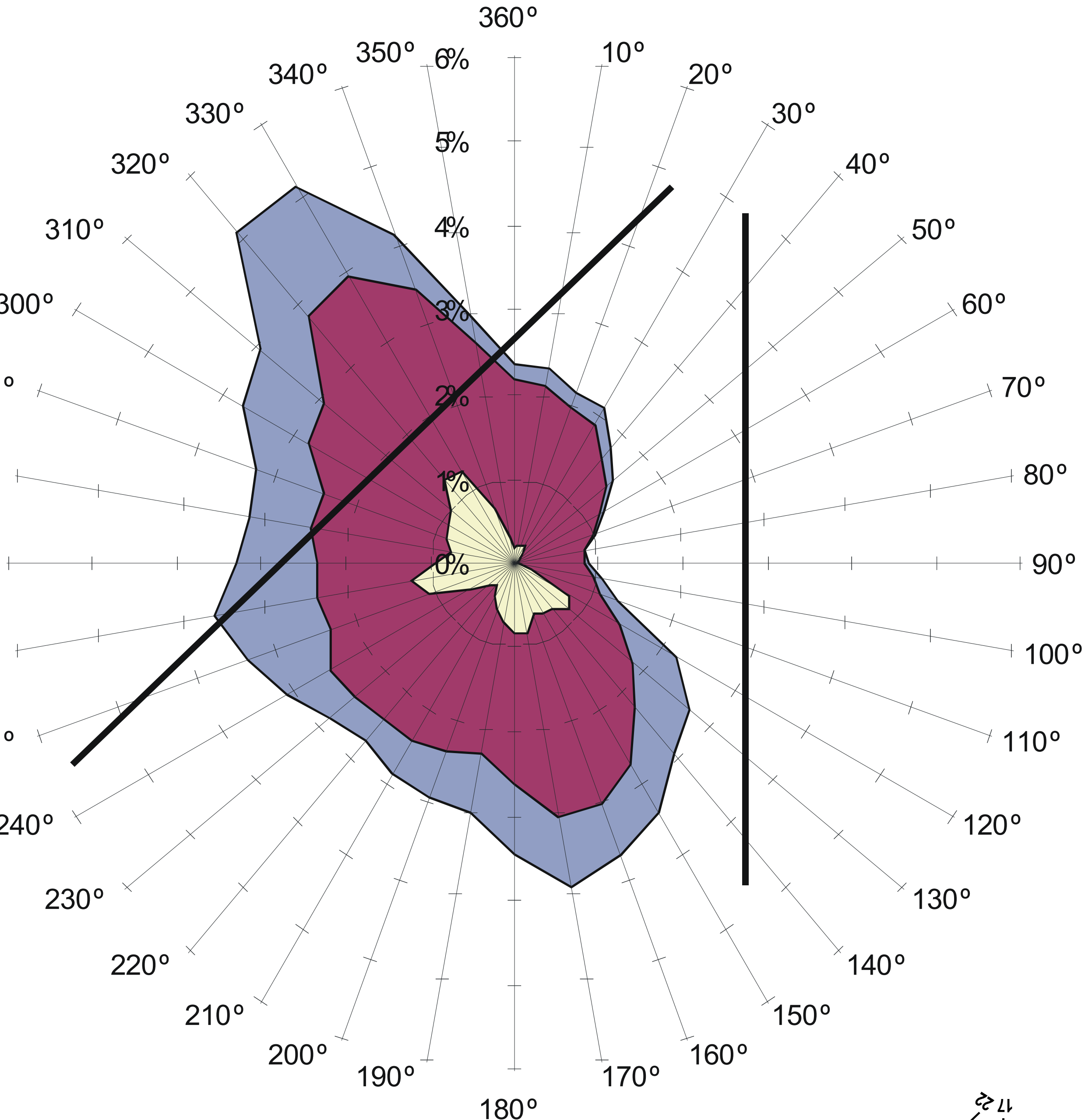
NUMBER OF OBSERVATIONS BY METEOROLOGICAL CONDITION
Double Eagle II Airport
Master Plan Study

Approach[1]	Aircraft Approach Category[2]	Meteorological Condition	Number of Observations[3]	Percent of Total Observations
n/a	n/a	VMC (VFR)	103,303	98.33%
Circling ILS/GPS	D	IMC-1 (IFR)	32	0.03
Circling ILS/GPS	C	IMC-2 (IFR)	57	0.05
Circling ILS/GPS	A, B	IMC-3 (IFR)	77	0.07
GPS	D	IMC-4 (IFR)	145	0.14
Localizer	D	IMC-5 (IFR)	151	0.14
GPS/Localizer	A, B, C	IMC-6 (IFR)	151	0.14
ILS	A, B, C, D	IMC-7 (IFR)	422	0.40
n/a	n/a	Below CAT-I ILS Minimum Conditions	718	0.68

n/a = not applicable.

1 All published approaches are to Runway 22.
2 Aircraft Approach Category A = Speed less than 5 knots; Aircraft Approach Category B = Speed 91 knots or more but less than 121 knots; Aircraft Approach Category C = Speed 121 knots or more but less than 141 knots; and Aircraft Approach Category D = Speed 141 knots or more but less than 166 knots.
3 April 1, 2000 through March 31, 2001.

Source: FAA Microcomputer Airport Design Program, Version 4.2, April 2001; FAA AC150/5300-13, Change 6, Airport Design; URS Corporation, 2001.

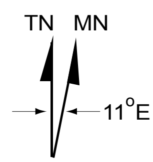


Total Observations: 94,421

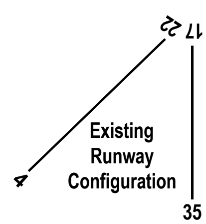
- All Wind Velocities
- Wind Velocities of 0 to 10 knots*
- Wind Velocities of 11 knots and higher*

*as percentage of All Wind Velocities

URS Corporation, 2001



TN = True North
MN = Magnetic North



NOTES:
This chart plots the percentage of recorded occurrences that wind blew from each true compass heading during the data period.

Wind Tabulation Data

Source: AWOS-3
Double Eagle II Airport - Albuquerque, NM
Data Period: April 1, 2000 - March 31, 2001

Wind Rose
FAA Microcomputer Airport Design Program, Version 4.2

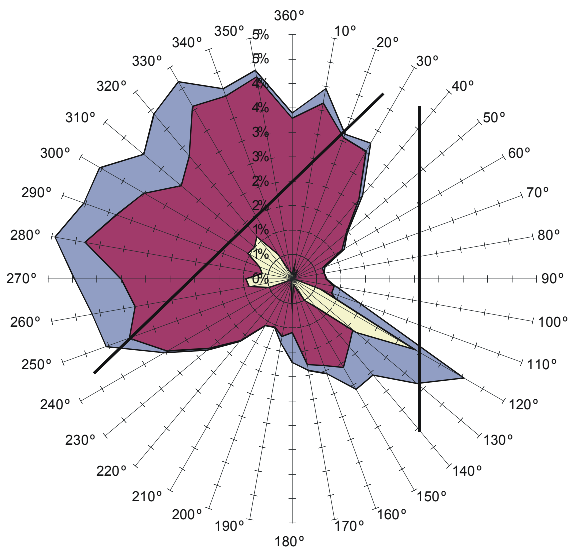
DOUBLE EAGLE II AIRPORT

MASTER PLAN UPDATE

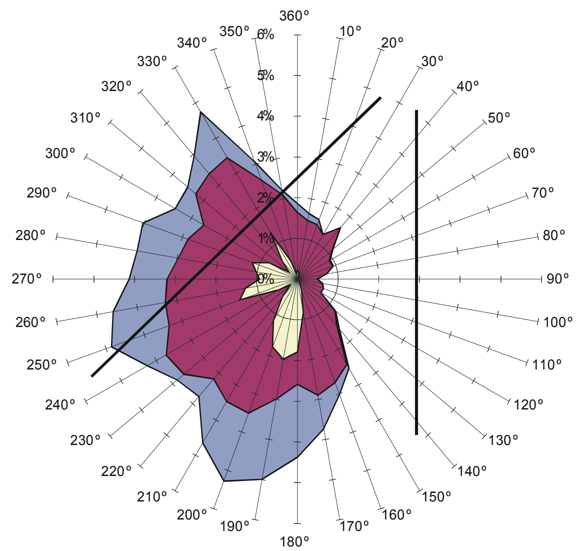
ANNUAL ALL WEATHER WIND PERSISTENCY CHART

FIGURE 6.2

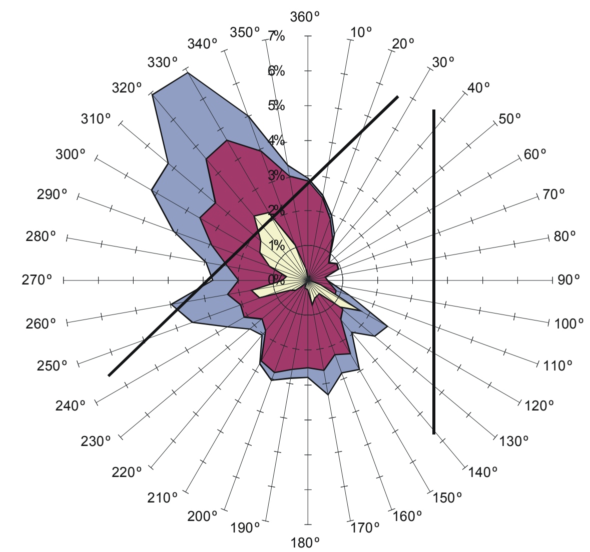
JANUARY



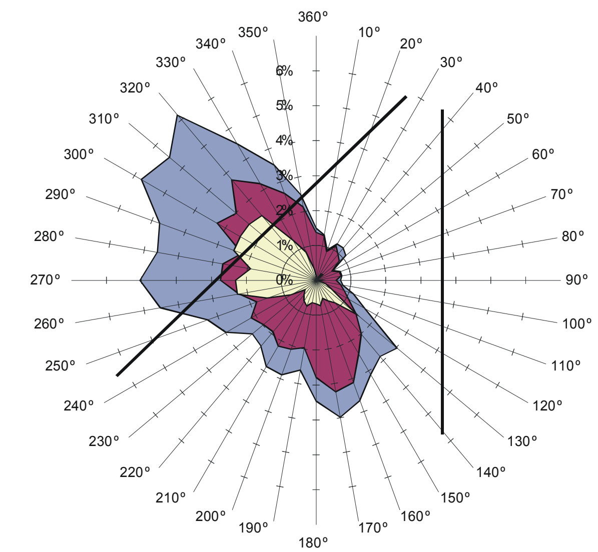
FEBRUARY



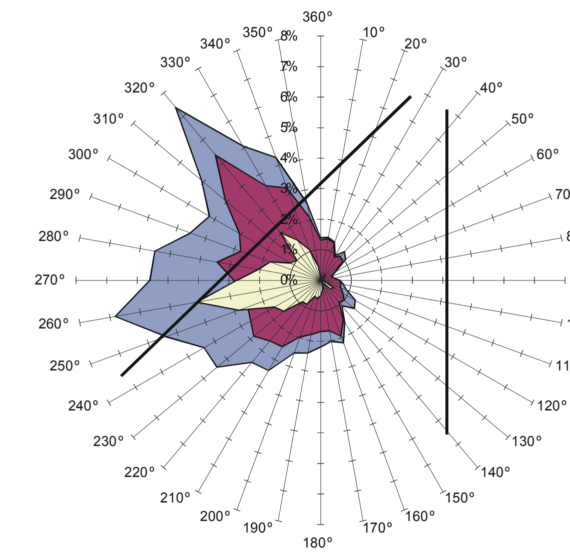
MARCH



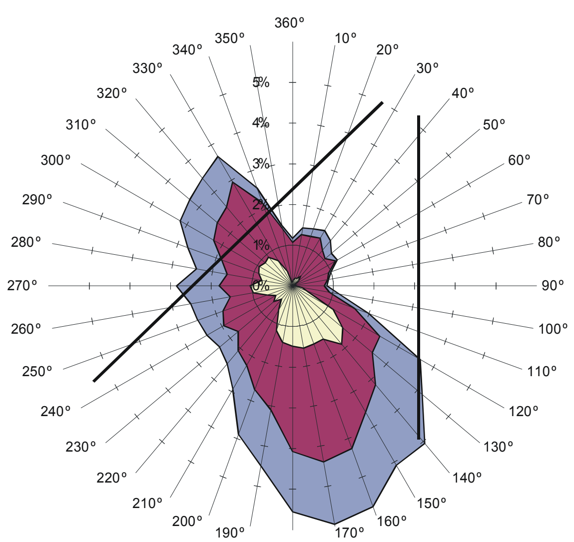
APRIL



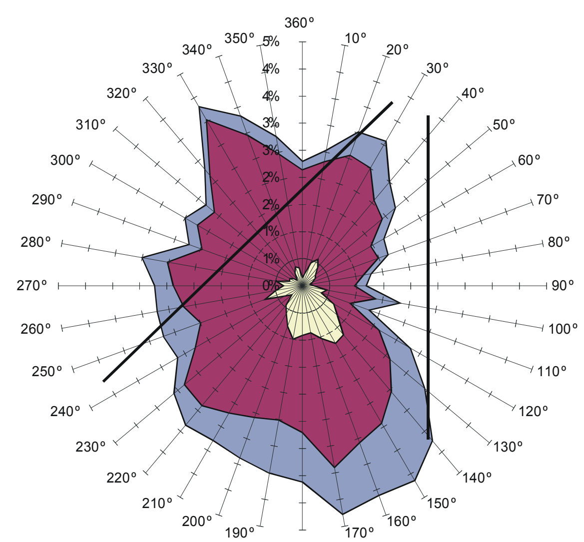
MAY



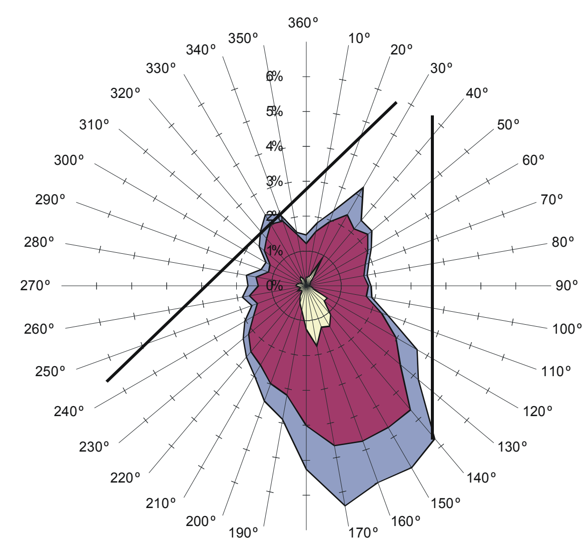
JUNE



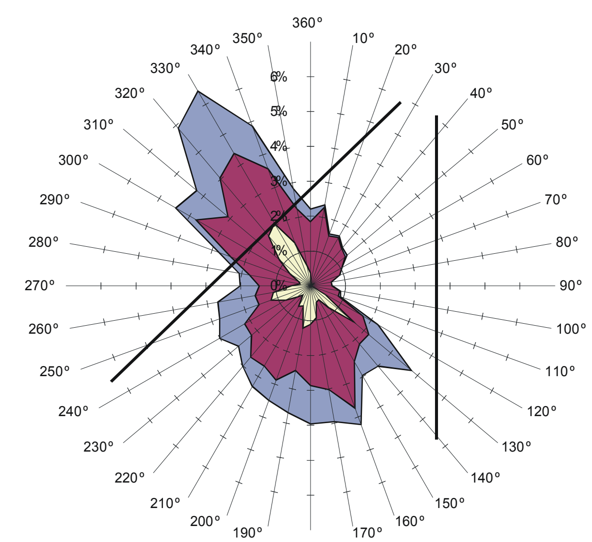
JULY



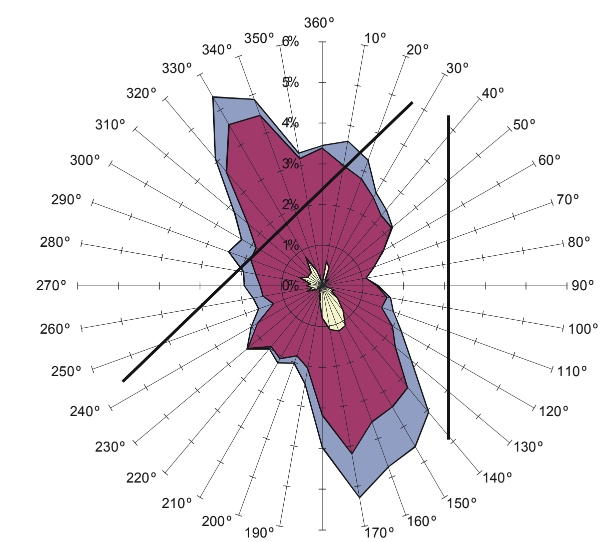
AUGUST



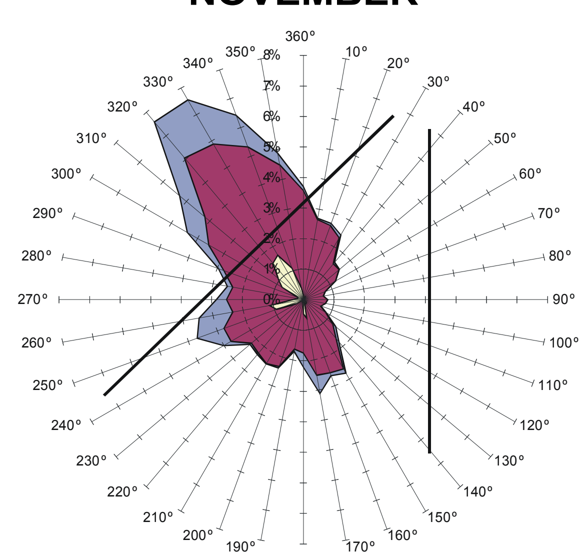
SEPTEMBER



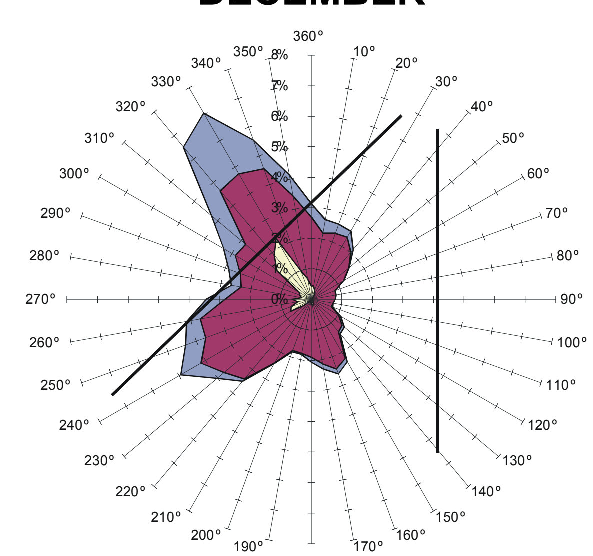
OCTOBER



NOVEMBER



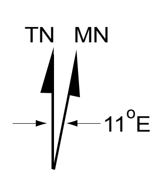
DECEMBER



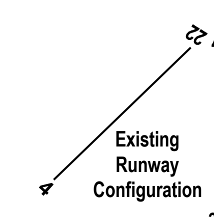
All Wind Velocities
Wind Velocities of 0 to 10 knots*
Wind Velocities of 11 knots and higher*

*as percentage of All Wind Velocities

URS Corporation, 2001



TN = True North
MN = Magnetic North



Notes:

These charts plot the percentage of recorded occurrences that wind blew from each true compass heading during that data period.

Wind Tabulation Data

Source: AWOS-3
Double Eagle II Airport - Albuquerque, NM
Data Period: April 1, 2000 - March 31, 2001

Wind Rose
FAA Microcomputer Airport Design Program, Version 4.2

DOUBLE EAGLE II AIRPORT

MASTER PLAN UPDATE

MONTHLY ALL WEATHER WIND PERSISTENCY CHART

FIGURE 6.3

6.2.7 Existing Runway Wind Coverage Conditions

After analyzing the wind data for Double Eagle II Airport using the FAA's Microcomputer Airport Design Program, it was found that the existing Runways 4/22 and 17/35 provided an all weather wind coverage of 94.55 percent, using a 10.5-knot crosswind component to represent the smallest and lightest group of aircraft that use the runway. The wind coverage of the existing runways for the selected meteorological conditions is shown in Table 6.2. The wind coverage is listed for crosswind components of 10.5 knots and 13 knots (the most critically affected aircraft). Using standard methodology for graphical depiction of wind coverage, Figure 6.1 shows the existing Runways 4/22 and 17/35 wind roses for the all weather condition. The wind roses use the 20-knot crosswind component (representing an ARC of C-III, or the design aircraft of the airport) and the 10.5-knot crosswind component (representing an ARC of A-I or B-I, or the *most critically affected* aircraft types).

TABLE 6.2

EXISTING RUNWAY WIND ANALYSIS
Double Eagle II Airport
Master Plan Study

Approach[1]	Aircraft Approach Category[2]	Meteorological Condition	Crosswind Component (knots)	Crosswind Coverage (Percent)
n/a	n/a	All Weather	10.5	94.55
			13.0	97.13
n/a	n/a	VMC (VFR)	10.5	94.57
			13.0	97.15
Circling ILS/GPS	D	IMC-1 (IFR)	10.5	95.32
			13.0	99.85
Circling ILS/GPS	C	IMC-2 (IFR)	10.5	92.53
			13.0	97.68
Circling ILS/GPS	A, B	IMC-3 (IFR)	10.5	94.66
			13.0	98.34
GPS	D	IMC-4 (IFR)	10.5	95.90
			13.0	98.36
Localizer	D	IMC-5 (IFR)	10.5	96.10
			13.0	98.44
GPS/Localizer	A, B, C	IMC-6 (IFR)	10.5	96.13
			13.0	98.45
ILS	A, B, C, D	IMC-7 (IFR)	10.5	95.72
			13.0	97.30
n/a	n/a	Below Category I ILS Minimum Conditions	10.5	90.01
			13.0	94.56

n/a = not applicable.

1 All published approaches are to Runway 22.
2 Aircraft Approach Category A = Speed less than 5 knots; Aircraft Approach Category B = Speed 91 knots or more but less than 121 knots; Aircraft Approach Category C = Speed 121 knots or more but less than 141 knots; and Aircraft Approach Category D = Speed 141 knots or more but less than 166 knots.
3 April 1, 2000 through March 31, 2001.

Source: FAA Microcomputer Airport Design Program, Version 4.2, April 2001; FAA AC 150/5300-13, Change 6, *Airport Design*; URS Corporation, 2001.

Though the annualized cumulative wind coverage for the existing runway with a 10.5-knot crosswind component is close to reaching the 95 percent coverage recommended by the FAA for safety purposes, the runway experiences deteriorating crosswind coverage during the late winter and early spring months. Figure 6.4 shows the Runways 4/22 and 17/35 wind coverage by month relative to the 95 percent crosswind coverage. For five out of six consecutive months beginning in January, the wind coverage of the runway is between 88.02 percent and 93.08 percent. The wind persistency graphs shown on Figure 6.3 display this seasonal shift in wind direction.

Supplemental analysis showed that the single runway orientation with the highest crosswind coverage on an all-weather annual basis was 136/316 degrees true heading (125/305 degrees magnetic heading). These headings would correlate with a runway designation of 13/31. Further analysis revealed that the single runway orientation with the highest wind coverage on an all-weather basis from January to June (shown on Figure 6.4) was 115/295 degrees true heading (104/284 degrees magnetic heading). These headings would correlate with a runway designation of 10/28. Figure 6.5 shows the monthly crosswind coverage of the existing runway system with and without the crosswind Runway 10/28. The crosswind coverage (with a 10.5-knot crosswind component) is well above the recommended 95 percent in each month with Runway 10/28.

6.3 AIRFIELD CAPACITY

6.3.1 Introduction

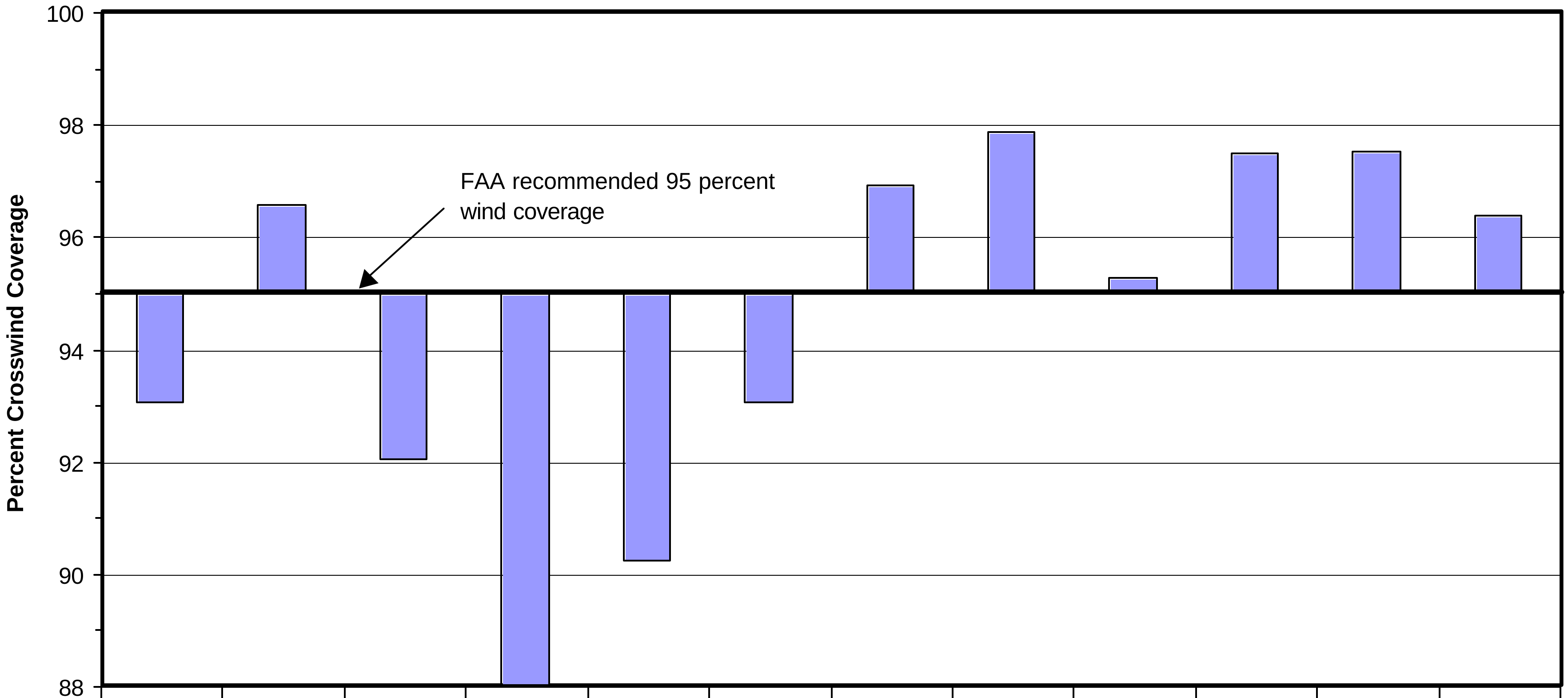
The determination of airfield capacity is key to the evaluation of the adequacy of the runway and taxiway (airfield) system to meet existing and future airport activity demand levels. Hourly capacities under VFR and IFR and the annual airport service volume for the open "V" runway system were determined using methodologies as specified in FAA AC 150/5060-5, *Airport Capacity and Delay*. This methodology has been employed industry-wide for airport capacity analysis and airport master planning, and has been adopted for use within this Airport Master Plan.

The airfield capacity of Double Eagle II Airport is restricted at present when afternoon winds from the west and northwest exceed 15 to 20 miles per hour resulting in crosswinds above 12 miles per hour for both Runways 4/22 and 17/35. There are also strong winds from the southwest, but they do not prevent operations due to the orientation of Runway 22. These winds are reported to be seasonal, occurring approximately eight to nine months each year and shown in the previously presented wind persistency graphs, which does not make them a major consideration in demand/capacity calculations.

Operations during afternoon hours also decline during summer months due to rough flying conditions created by strong updrafts over heated soils. However, declines in afternoon operations due to strong updrafts are common to most airports.

FIGURE 6.4

MONTHLY CROSSWIND COVERAGE OF EXISTING RUNWAYS 4/22 AND 17/35
WITH CROSSWIND COMPONENT OF 10.5 KNOTS
Double Eagle II Airport
Master Plan Study

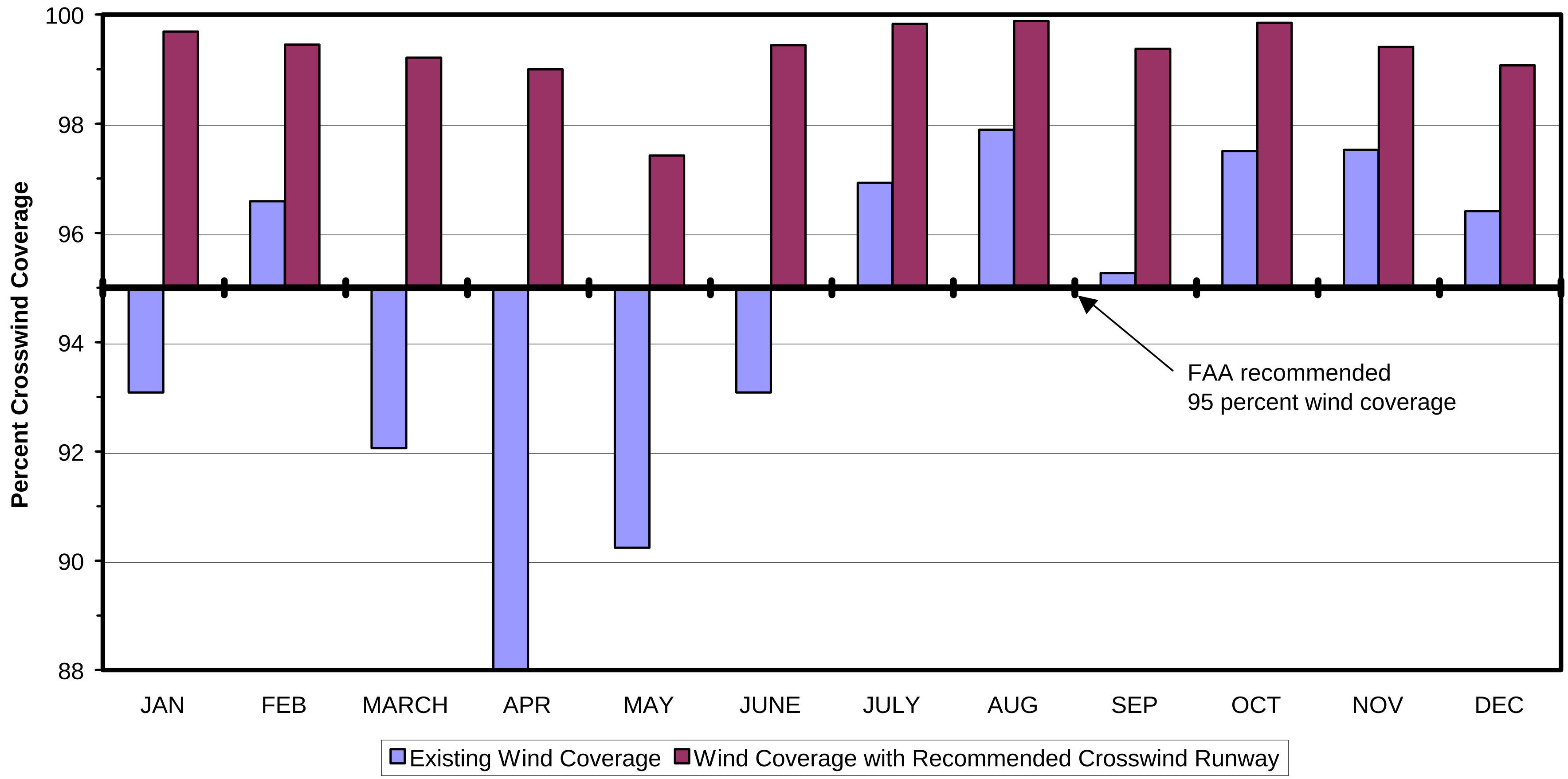


	JAN	FEB	MARCH	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
%	93.08	96.58	92.06	88.02	90.24	93.08	96.92	97.89	95.27	97.5	97.52	96.4

Source: URS Corporation, 2001.

FIGURE 6.5

MONTHLY CROSSWIND COVERAGE OF EXISTING RUNWAYS 4/22 AND 17/35, AND RECOMMENDED CROSSWIND RUNWAY 10/28 WITH CROSSWIND COMPONENT OF 10.5 KNOTS
Double Eagle II Airport
Master Plan Study



Source: URS Corporation, 2001.

6.3.2 Basis of Calculated Capacities

Calculated airfield capacities are developed by methods and capacity assumption criteria described in FAA AC 150/5060-5, *Airport Capacity and Delay*, dated September 23, 1983. Calculations are based on runway utilization rates, which produce the highest sustainable capacity consistent with current air traffic control (ATC) rules and practices. Values used in the calculations are representative of typical U.S. airports having similar runway configurations. The parameters and assumptions used in the calculations are detailed in the following sections.

6.3.3 Runway-Use Configuration

Double Eagle II Airport has two runways. Runway 4/22 is 7,400 feet x 100 feet and is oriented northeast/southwest. Runway 17/35 is 6,000 feet x 100 feet and is oriented north/south. The existing runway-use open "V" configuration was used for capacity calculations.

6.3.4 Aircraft Mix Index

The FAA has established a classification system for the various sizes, weights, and performance of aircraft as shown in Table 6.3. These classifications allow the calculation of a "mix index" for use in airfield (runway) capacity studies. The mix index is stated as a percent and is calculated as the percent of Class C aircraft operations plus three times the percent of Class D aircraft operations (C+3D). Mix indices fall into five ranges for use with capacity calculations. These are 0 to 20, 21 to 50, 51 to 80, 81 to 120, and 121 to 180. Since there are no Class D aircraft (above 300,000 pounds) operations at Double Eagle II Airport (and none forecast), a mix index of 0 to 20 would require that more than 20 percent of total operations be by Class C aircraft (12,500 to 300,000 pounds). Current activities indicate that Class C aircraft comprise less than 10 percent of total operations. Therefore, a mix index of 0 to 20 is used in capacity calculations for this master plan.

TABLE 6.3

AIRCRAFT CLASSIFICATION SYSTEM FOR AIRPORT CAPACITY AND DELAY ANALYSIS
Double Eagle II Airport
Master Plan Study

Aircraft Classification	Type of Aircraft
Class A	Small single-engine aircraft weighing 12,500 pounds or less
Class B	Small multi-engine aircraft weighing 12,500 pounds or less.
Class C	Large multi-engine aircraft weighing more than 12,500 pounds but less than 300,000 pounds.
Class D	Heavy aircraft weighing more than 300,000 pounds.

Source: FAA AC 150/5060-5, *Airport Capacity and Delay*, September 23, 1983.

6.3.5 Percent Arrivals

It is safe to assume that total annual arrivals will equal total annual departures at Double Eagle II Airport. Average daily arrivals and departures should also be equal. VFR and IFR busy hour operations may not be equal however. Arrivals under IFR conditions may be less than departures as it is easier to utilize IFR departure procedures (assuming good weather at destinations) than to be equipped and rated for IFR approach procedures. The calculation data differentiates between arrival/departure percents of 40, 50, and 60 percent for some operating conditions with the lower percentages resulting in the highest hourly capacities. The difference between 40 and 50 percent is not great, however, and IFR capacities are only a small part of annual capacities. Therefore, it is reasonable to use any of these values. For the basis of calculations used in this study, 50 percent arrivals were used.

6.3.6 Percent of Touch-and-Go Operations

The FAA runway capacity calculation methods and data recognize six ranges of percent of touch-and-go operations. These include 0 (representing the lowest airfield capacity), 1 to 10, 11 to 20, 21 to 30, 31 to 40, and 41 to 50 (representing the highest airfield capacity). Observed operations from the Inventory site visit as well as input from airport management indicate a high level of touch and go operations at Double Eagle II Airport. Therefore, a level of 41 to 50 was used for capacity calculations for this master plan study.

6.3.7 Taxiway Exit Factors

The highest runway capacities result when full-length, parallel, and non-crossing taxiways with ample runway entrance/exit taxiways are available. Taxiway exit factors for existing runways can be determined by their location and criteria stated for each runway-use configuration determined from FAA AC 150/5060-5. It is assumed for calculation of future runway capacities that optimum exit taxiway systems will be constructed.

6.3.8 Airspace Limitations

Capacity calculations were performed without penalties due to airspace or navigational aid (NAVAID) restrictions.

6.3.9 VFR Hourly Capacity

Using a generalized approach to determining VFR hourly capacity at Double Eagle II Airport, it is estimated that the existing airfield can accommodate 150 operations per hour during VMCs.

6.3.10 IFR Hourly Capacity

Using a generalized approach to determining IFR hourly capacity at Double Eagle II Airport, it is estimated that the existing airfield can accommodate 59 operations per hour during IMC.

6.3.11 Annual Service Volume

The Annual Service Volume (ASV) is defined as a reasonable estimate of an airport's annual capacity. The ASV accounts for differences in runway use, aircraft mix, and weather conditions that would be encountered over a year's time. Using the generalized approach found in FAA AC 150/5060-5, it was determined that the ASV for the existing Double Eagle II Airport airfield provides an estimated capacity of 270,000 annual operations. Figure 6.6 shows the existing and forecasted operations (by forecast scenario) with 60, 80, and 100 percent of the ASV. The 60 and 80 percent thresholds are shown to serve as placeholders to determine when planning and design of facilities to provide additional capacity should take place.

Figure 6.5 shows that using the medium to high forecast scenarios, demand will approach or exceed the ASV by 2016. Both forecast scenario demand levels would exceed the ASV by 2021. Therefore, the airfield capacity will be reached and delay will occur. Additional runway capacity will be required in the long-term (15- to 20-year) future to accommodate forecast demand.

6.4 RUNWAY LENGTH

6.4.1 Introduction

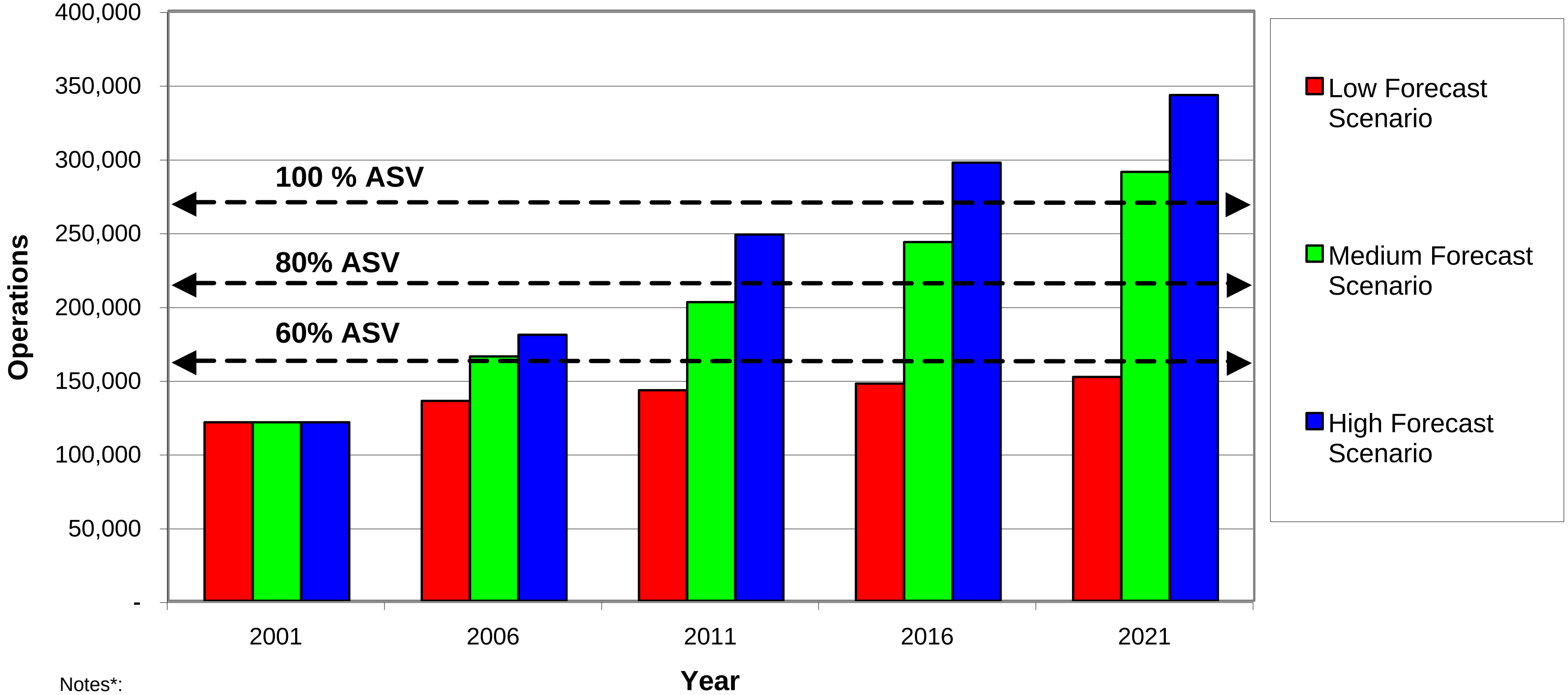
Runway length demand/capacity is based on several factors such as: airport elevation, mean daily maximum temperature, runway longitudinal gradient, aircraft operating fleet mix, runway surface conditions, aircraft stage-length distance, typical payloads, and frequency of operation by various aircraft. Based on aircraft operating fleet mix projections presented in Section 5.0, Forecasts of Aviation Demand, critical aircraft groups and runway length requirements were identified.

6.4.2 Balanced Field Length Analysis

Data regarding the safe operational runway length requirements for business jet aircraft that currently operate or could potentially operate at Double Eagle II Airport are presented in Tables 6.4 and 6.5. These tables were compiled to determine what performance limitations, if any, aircraft may experience at Double Eagle II Airport. These limitations are based on Double Eagle II Airport specific variables such as elevation, mean daily maximum temperature, and existing runway length.

FIGURE 6.6

OPERATIONS FORECAST SCENARIO SUMMARY WITH ANNUAL SERVICE VOLUME
Double Eagle II Airport
Master Plan Study



Notes*:
100% ASV - 270,000 Annual Service Volume
80% ASV - 216,000 Annual Service Volume
60% ASV - 162,000 Annual Service Volume
*FAA Advisory Circular 150/5060-5

Last Updated: February, 2002

Source: URS Corporation, 2002.

TABLE 6.4

BALANCED FIELD LENGTH REQUIREMENTS FOR HIGH PERFORMANCE AIRCRAFT FLEET
Double Eagle II Airport
Master Plan Study

Aircraft Type	ARC[5]	Balanced Field Length (BFL)					
		I.S.A. at Sea Level[1]		BFL Considering DEII Density[2] Altitude Only		BFL Considering DEII Density Altitude and Runway 4/22 Available Length[3]	
		BFL (ft.)[6]	Maximum Takeoff Weight (MTOW) (lbs.)	BFL (ft.)	Maximum Allowable Takeoff Weight (% of MTOW)[4] (lbs.)	BFL (ft.)	Maximum Allowable Takeoff Weight (% of MTOW) (lbs.)
Boeing 717-200	C-III	5,900	114,000	10,000	114,000 (100%)	7,400	106,000 (93%)
Dassault Falcon 20D	B-II	3,250	27,337	5,200	24,000 (88%)	5,200	24,000 (88%)
LearJet 31A	B-II	3,490	17,000	7,400	15,980 (94%)	7,400	15,980 (94%)
Hawker 800-XP	B-II	5,030	28,000	8,586	24,545 (88%)	7,400	23,400 (83%)
Hawker 125-800	B-II	5,600	27,400	9,800	23,400 (85%)	7,400	20,900 (76%)
LearJet 45	C-I	4,350	20,500	10,230	19,970 (97%)	7,400	18,140 (88%)
Cessna Citation V (Model 560)	C-II	3,180	16,300	5,540	16,300 (100%)	5,540	16,300 (100%)
Cessna Citation VII (Model 650)	C-II	1,690	23,000	8,670	23,000 (100%)	7,210	21,000 (91%)
Cessna Citation X (Model 750)	C-II	5,580	34,500	10,165	34,500 (100%)	7,320	31,000 (90%)
Dassault Falcon 2000	C-II	5,240	35,800	6,900	33,000 (92%)	6,900	33,000 (92%)
Gulfstream V	C-III	6,110	90,500	11,100	90,500 (100%)	7,400	79,000 (87%)
LearJet 60	D-I	5,450	23,500	9,620	22,220 (95%)	7,400	19,955 (85%)
Canadair Regional Jet (CRJ) Model CL-600-2B19, Series 200	D-II	5,000	47,700	7,400	47,700 (100%)	7,400	47,700 (100%)
Gulfstream III	D-II	5,115	69,700	7,000	60,000 (86%)	7,000	60,000 (86%)
Gulfstream IV SP	D-II	5,450	74,600	8,000	68,000 (91%)	7,400	66,000 (88%)
Global Express	C-III	5,820	95,000	7,616	85,137 (90%)	7,400	83,953 (88%)
Eclipse 500	unknown	2,400	4,700	n/a	n/a	n/a	n/a

n/a = not available.

1 International Standard Atmospheric Conditions, 0 ft. MSL Elevation, 59°1 F.
2 5,837 feet MSL Elevation, 92.5° F (Density Altitude = 9,192 feet).
3 7,400 feet.
4 If less than 100%, then aircraft is limited due to takeoff climb requirements.
5 Airport Reference Code.
6 Balanced Field Length

Sources: Bombardier Aerospace, February 2000; Cessna Aircraft Company, February 2000; Dassault Falcon Jet, February 2000; Raytheon Aircraft, February 2000; Gulfstream Aerospace, February 1994; Climatography of the United States No. 81, Monthly Station Normals of Temperature, Precipitation, and heating and Cooling Degree Days 1961-1990: New Mexico, NOAA; and Eclipse Aviation.

Compiled by URS Corporation, 2001.

TABLE 6.5

FAA RECOMMENDED RUNWAY LENGTHS
Double Eagle II Airport
Master Plan Study

Critical Aircraft	Runway Length (ft.)
Small Airplanes with less than 10 passenger seats	
75 percent of these small airplanes	5,160
95 percent of these small airplanes	7,310
100 percent of these small airplanes	7,310
Small Airplanes with 10 or more passenger seats	7,310
Large Airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	7,180
75 percent of these large airplanes at 90 percent useful load	8,600
100 percent of these large airplanes at 60 percent useful load	11,000
100 percent of these large airplanes at 90 percent useful load	11,000

Source: FAA AC 150/5325-4A, *Runway Length Requirements for Airport Design*.

The balanced field length (BFL) requirement of an aircraft is the length where the accelerate-stop distance is equal to the takeoff distance (to an altitude of 35 feet agl). The accelerate-stop distance is the runway length required to accelerate an airplane to the takeoff decision speed, and assuming failure of the critical engine at the instant the takeoff decision speed is attained, to bring the airplane to a complete stop on the runway.

The aircraft manufacturer establishes an airplane's Maximum Takeoff Weight (MTOW), which is limited by aircraft structural strength and airworthiness requirements. MTOW is established based on is 0 feet mean sea level (msl) and 59° F ISA (International Standard Atmospheric) conditions. This weight is the maximum weight an aircraft can safely operate at and is usually achieved at the start of the takeoff run.

Maximum Allowable Takeoff Weight can be equal to the manufacturer's established MTOW or can be reduced by limiting factors such as meteorological conditions (i.e., temperature), airfield elevation, runway length, and/or runway end obstructions.

Table 6.4 presents the BFL requirements and MTOW for the study aircraft at 0 feet msl and 59° F ISA conditions. This table also shows the BFL as calculated to Double Eagle II Airport conditions including an elevation of 5,837 feet msl and the mean daily maximum temperature of the hottest month, 92.5° F. Together, these factors produce a density altitude of 9,307 feet. The maximum runway length shown is calculated using the density altitude at Double Eagle II Airport (9,307 feet) and does not take into account the available runway length at Double Eagle II Airport. Therefore, anything less than 100 percent of MTOW at sea level reveals a takeoff climb requirement weight limitation, which is unrelated to available runway length. BFL considering Double Eagle II Airport density altitude and runway length available on Runway 4/22 (7,400 feet, the longest runway available at Double Eagle II Airport) is also calculated. The MTOWs shown represent the penalties that occur when the aircraft depart Double Eagle II Airport at a density altitude of 9,192 feet and runway length of 7,400 feet. A maximum allowable takeoff weight of 100 percent means that the aircraft can depart Double Eagle II Airport on Runway 4/22 without any weight restrictions. If an aircraft experienced a weight limitation based on density altitude alone, then that aircraft would experience the same limitation or greater when runway length is considered.

6.4.3 FAA Runway Length Requirements for Airport Design

Table 6.5 lists general FAA runway length recommendations based on the density altitude at Double Eagle II Airport. The critical aircraft type (in terms of runway length required) at Double Eagle II Airport is *Large Airplanes of 60,000 pounds or less*. Depending upon the percentage of the aircraft group and the useful load, the FAA recommends a runway length of 7,180 feet to 11,000 feet.

6.5 TAXIWAYS

It is necessary that parallel and adequate access taxiways be constructed to serve new runways and extensions in order to assure the airfield capacities calculated in this section.

6.6 NAVAIDS AND LIGHTING

Improvements to airfield pavements require supporting improvements to NAVAIDS and airfield lighting to reach calculated capacities.

6.6.1 Instrument Landing System

The single ILS system on Runway 4/22 will be adequate to accommodate forecast activities through the 20-year planning period. Possible justification of additional precision approaches to other runways using emerging technologies such as GPS might be the introduction of a flight academy teaching advanced flight training for commercial pilots.

New installations of ILS approaches will require the inclusion of compatible approach light systems, high intensity runway lights (HIRLs), and runway visibility range equipment.

6.6.2 Precision Approach Path Indicator

The FAA is recommending precision approach path indicators (PAPI) in new locations and when older equipment requires significant repair. PAPIs should be installed on each end of all runways to aid approaches and to enhance operational capacity and safety. Currently, Runways 4 and 17 have a PAPI installed. Therefore, it is recommended that a PAPI system be installed on Runways 22 and 35.

6.7 OPERATIONAL CONTROL

This section addresses the future needs of the airport from the aspect of airspace capacity and safety and is based on projected levels of current and projected local and itinerant general aviation activity. It is projected that the operational use by high performance turboprop and business jet aircraft, as well as itinerant aircraft practicing instrument approaches to the airport, will increase markedly over the 20-year planning period. Additionally, increased traffic from the closure of Coronado Airport and the shift in general aviation activity from Albuquerque International Sunport will generate additional local and itinerant traffic at Double Eagle II Airport. As such, many of the high-performance piston and/or jet aircraft have higher approach speeds and greater separation requirements than that currently utilized at the airport. The approach and departure speeds of larger, heavier aircraft will require careful coordination between pilots. To assure a greater margin of relative safety to users of the airport, particularly during peak periods, an Airport Traffic Control Tower (ATCT) is recommended.

Through its Contract Tower Program, FAA contracts ATC services to the private sector at Visual Flight Rule (VFR) airports. The primary advantages of the FAA Contract Tower (FCT) program are enhanced safety and improved ATC services. Double Eagle II Airport is a candidate for a FCT based on reaching specified operational levels. In 2000, the City of Albuquerque Aviation Department enrolled Double Eagle II Airport in the FCT Program for a traffic control facility at Double Eagle II Airport. Reasons presented for implementation of a FCT at Double Eagle II Airport include the following:

- Double Eagle II Airport is the designated general aviation reliever airport for the Albuquerque International Sunport.
- Double Eagle II Airport has a based aircraft count of 229 airplanes.
- The traffic mix includes helicopter operations, medivac flights, military operations, and a significant amount of student training.
- The operational level is estimated to be over 100,000 operations per year.

Congress has provided a means to allow facilities to enter into the FCT program through cost sharing. With this program, if the airport sponsor is willing, the FAA will enter into an arrangement to share the cost of ATC services. The formula used for determining the cost share is based on the benefit/cost (B/C) ratio. This alternative is available so as to enable funding of ATC services for Double Eagle II Airport.

An updated preliminary B/C analysis for Double Eagle II Airport was completed in June 2001. Site-specific information, as well as the information detailed in Double Eagle II Airport's application, was used to compute the B/C. The results of the analysis show that Double Eagle II Airport has a B/C ratio of 0.41 percent. Cost sharing would allow ATC services at Double Eagle II Airport with FAA funding at 41 percent of the cost, while Double Eagle II Airport would fund the remaining 59 percent.

6.8 AIRSPACE

6.8.1 Precision Approaches

The existing airfield consists of an ILS approach to Runway 22. While a single ILS is adequate for existing activities, an additional precision approach procedure would enhance the airfield for some type of advanced flight-training activities (intermediate to long-term timeframe). Additional NAVAIDs and/or precision approach procedures that will enhance the level of service at the airport will be evaluated in the airport alternatives section.

New installation of precision approach procedures would require the inclusion of compatible approach light systems, HIRLs, and runway visibility range equipment.

6.8.2 Approach Slopes

Existing approach slopes are shown in Section 3.7.2, Objects Affecting Navigable Airspace. Additional NAVAIDS and/or runway(s) would require updated FAR Part 77 Airspace Plan drawings to determine future approach slope requirements.

6.8.3 Obstructions

No obstructions are known to penetrate with current horizontal, transitional, approach or other Part 77 Imaginary Airspace Surfaces for Double Eagle II Airport.

6.9 PLANNING AND DESIGN CRITERIA

6.9.1 Airport Reference Code

As described in Section 6.2.2, the ARC has been established for the purposes of airfield and facility planning and design. The two components of the ARC are the Aircraft Approach Category and the ADG.

Aircraft Approach Categories affect runway separation standards (distances from taxiways, obstructions, etc.). The FAA groups aircraft in Aircraft Approach Categories based on 1.3 times their stall speed in their landing configuration at their maximum certificate landing weight. The categories are defined as follows:

A - Approach speeds less than 90 knots

B - Approach speed 91 knots or more, but less than 121 knots

C - Approach speed 121 knots or more, but less than 141 knots

D - Approach speed 141 knots or more, but less than 166 knots

E - Approach speed 166 knots or more

Aircraft are also divided into Airplane Design Groups (ADG) on the basis of their wingspan.

I - Wingspans up to, but not including 49 feet

II - Wingspans 49 feet up to, but not including 79 feet

III - Wingspans 79 feet up to, but not including 118 feet

IV - Wingspans 118 feet up to, but not including 171 feet

V - Wingspans 171 feet up to, but not including 214 feet

VI - Wingspans 214 feet up to, but not including 262 feet

According to the previous Airport Layout Plan (dated September 1991), the existing ARC is D-II. It is recommended that the ARC remain D-II for this Master Plan Study.

6.9.2 Airfield Facility Requirements

This section develops airfield facility requirements for the airport according to runway capacity, runway orientation, and required pavement strength. Other critical airfield related elements included in this section are airfield lighting and NAVAIDs.

The physical planning, layout and geometric sizing requirements for the runway and taxiway system were formulated according to pre-established airport planning criteria as prescribed by the FAA's AC 150/5300-13, Change 6, *Airport Design*. Runway and taxiway geometric design and lateral separation criteria vary from airport to airport and are directly related to operational and physical characteristics of aircraft that are anticipated to operate at the airport.

6.9.2.1 Runway Geometric Requirements

To accommodate projected activity and aircraft operational fleet mixes, the required overall length, widths, and separations of the existing and future runways were analyzed. To determine runway geometric requirements, several planning assumptions were utilized:

- The airport has a field elevation of 5,837 feet (msl).
- The mean-daily maximum temperature is 92.5° F.
- On the hottest day, the density altitude is 9,192 feet (msl).
- Existing and future operational aircraft fleet mix will operate at maximum design loads.
- Business jets will operate at varying stage lengths, or non-stop distances.
- Based on assumed potential change in the operational fleet mix as a result of the migration of high performance business jet aircraft to Double Eagle II Airport, the airport's ARC should remain D-II. Requirements for C-III aircraft are shown in the following tables to represent the "critical" aircraft (assumed to be the Gulfstream V, shown in Table 6.4).

<u>Runway Length</u> – Based on aircraft-specific BFL requirements shown in Table 6.4 and FAA recommended runway lengths shown in Table 6.5, a runway length of 11,000 feet is required to accommodate the existing and proposed fleet mix of high performance aircraft at Double Eagle II Airport.

<u>Runway Width</u> – The current runway width of 100 feet meets the FAA's prescribed planning criteria for ADG-II and -III aircraft. Future runways should be built to a minimum of 100 feet in width.

<u>Runway-to-Taxiway Separation</u> – The existing runway-to-taxiway centerline separation is 400 feet. ARC D-II and C-III planning criteria (Table 2-2 in FAA AC 150/5300-13, Change 6) specifies a separation of 400 feet. All future runway-to-taxiway separations should be a minimum of 400 feet.

Table 6.6 lists the runway design standards related to ARC D-II and C-III facilities. Existing runways at Double Eagle II Airport meet or exceed the design group II standards. All future runways should be designed to meet these standards.

TABLE 6.6

RUNWAY DESIGN STANDARDS FOR AIRCRAFT APPROACH CATEGORIES C AND D
Double Eagle II Airport
Master Plan Study

Item	Airplane Design Group II Dimensions	Airplane Design Group III Dimensions
Runway Width	100 feet	100 feet
Runway Shoulder Width	10 feet	20 feet
Runway Blast Pad Width	120 feet	140 feet
Runway Blast Pad Length	150 feet	200 feet
Runway Safety Area Width	500 feet	500 feet
Runway Safety Area Length beyond Runway End	1,000 feet	1,000 feet
Runway Object Free Area Width	800 feet	800 feet
Runway Object Free Area Length beyond Runway End	1,000 feet	1,000 feet
Runway Separation to Taxiway/Taxilane Centerline*	400 feet	400 feet
Runway Separation to Aircraft Parking Area*	500 feet	500 feet

* Runways with lower than 3/4-statute mile approach visibility minimums.

Source: FAA AC 150/5300-13, Change 6, *Airport Design*.

6.9.2.2 Taxiway/Taxilane Geometric Requirements

Taxiway requirements are addressed to maintain current and future airfield capacity levels, and to provide more efficient and safe ground traffic movements. Taxiways provide a vital link between independent airport elements, and should optimize airport functions by providing free movement to and from the runway(s), FBO/terminal areas, and aircraft parking areas. Requirements for existing and future taxiway and taxilane systems for the airport are presented in the following sections.

<u>Taxiway Location and Orientation</u> – Several types of taxiways comprise the taxiway system at any airport. These systems may include entrance and exit taxiways, bypass taxiways, parallel taxiways, and apron taxiways, and taxilanes. Future taxiway placement and design at Double Eagle II Airport should meet the following key planning goals.

- Each runway should have a full-length parallel taxiway.
- Taxiways should be as direct as possible.
- Bypass capability to multiple access points to runway ends should be provided.
- Runway bottlenecks should be minimized.

Taxiway Width – Based on the projected operational aircraft fleet mix over the 20-year planning period, the width of both full-length parallel taxiways and 9 entrance/exit taxiways complies with the FAA's ARC D-II geometric width standards. All future taxiways should be designed to at least 35 feet in width.

Geometric requirements for the existing taxiway system are shown in Table 6.7.

TABLE 6.7

TAXIWAY DIMENSIONAL STANDARDS
Double Eagle II Airport
Master Plan Study

Item	Airplane Design Group II Dimensions	Airplane Design Group III Dimensions
Taxiway Width	35 feet	50 feet
Taxiway Edge Safety Margin	7.5 feet	10 feet
Taxiway Shoulder Width	10 feet	20 feet
Taxiway Safety Area Width	79 feet	118 feet
Taxiway Object Free Area Width	131 feet	186 feet
Taxilane Object Free Area Width	115 feet	162 feet

Source: FAA AC 150/5300-13, Change 6, *Airport Design*.

6.9.2.3 Lighting and NAVAID Criteria

This section will address the potential need for enhanced NAVAID facilities during the 20-year planning period. As indicated in Section 3.0, Existing Airport Facilities Inventory, the airport has an existing complement of visual and electronic NAVAIDS. Runway 22 is equipped with an ILS, which includes a localizer glide slope, and a medium intensity approach lighting system with runway alignment indicator lights (MALSR). Runway 4 and Runway 17 are equipped with a PAPI. Both ends of Runway 17/35 are equipped with runway end identifier lights (REIL).

Instrument Landing System – Runway 22 is equipped with an ILS. While one ILS is considered adequate for the immediate needs of Double Eagle II Airport, consideration should be given to installing and certifying an additional precision approach at the airport if future operational levels require an additional precision approach. Significant increases in flight training and high performance jet activity at Double Eagle II Airport would require an additional precision approach to enhance safety.

MALSR Approach Lighting – The existing MALSR system extends northeast beyond the approach end of Runway 22 along the extended runway centerline for 3,000 feet. The MALSR serves as an integral part of the ILS. It is considered adequate to serve the anticipated approach lighting needs for Runway 22 throughout the 20-year planning period.

PAPI Approach Lighting – The existing PAPI system located on Runway 4 and Runway 17 is anticipated to adequately meet the needs required for visual approaches to these runways. It is recommended that a PAPI system be installed on Runway 22 and Runway 35. The PAPI system is anticipated to remain the mainstay of NAVAIDS serving visual approaches throughout the 20-year planning period.

Runway Edge Lighting – Runway 4/22 and Runway 17/35 are currently configured with Medium Intensity Runway Lights (MIRL). As the recommended ILS configuration utilizes HIRLs, it is recommended that the runway edge lighting system be upgraded from MIRL to HIRL on Runway 4/22.

Runway Signing – The runway signage is in poor condition due to funding. It is recommended that new runway signage be installed within five years.

Taxiway Edge Lighting – At present, parallel Taxiway "A" and "B" are lighted with Medium Intensity Taxiway Lights. It is recommended that any new taxiway be lighted with at least Medium Intensity Taxiway Lights.

Taxiway Signing – The taxiway signage is the original equipment installed and is in poor condition. The signs are either fading or delaminated. It is recommended that new taxiway signage be installed within five years.

Rotating Beacon – Inspection of the airport's rotating beacon reveals that it is in fair to poor condition and replacement is required.

Airfield Electrical Vault – The entire airfield and apron complex is served by a single electrical vault with a 400 A main breaker. The vault houses 7.5 KW regulators for each runway, taxiway system, and apron lighting. The vault also houses a transformer for the windsock and a backup generator. Vault power is routed to the airfield through two 6-inch conduits. The airfield electrical vault is adequate for the current airfield configuration. The electrical demand should be re-examined in the future to determine if additional requirements are needed.

6.10 SUMMARY OF AIRSIDE FACILITY REQUIREMENTS

6.10.1 Increased Available Runway Length

An extension of Runway 4/22 is recommended. Runway 4/22 should be extended by 3,600 feet to the south (to 11,000 feet in length), which would provide for takeoffs by corporate jet aircraft that are currently limited on the existing runway lengths due to the density altitude at Double Eagle II Airport, as shown in Table 6.4. Providing capability for their operation at Double Eagle II Airport would relieve general aviation traffic demands at Albuquerque International Sunport as well as enhance the level of safety at Double Eagle II Airport.

An extension of Runway 4/22 would also require the following additional work:

- Extend parallel taxiway system;
- Replace runway edge lighting with HIRLs and add HIRLs to extension;
- Extend medium intensity taxiway lights;
- Relocate localizer antenna and transmitter;
- Relocate or install PAPIs for Runway 4 approach;
- Relocated REILs;
- Add a supplementary lighted wind cone for Runway 4 approaches;
- Runway distance remaining signs; and
- Runway and taxiway marking.

If the medium or high forecast (shown in Section 5.0, Forecasts of Aviation Demand) is realized at Double Eagle II Airport, then an extension of Runway 17/35 is also recommended by 2021. Runway 17/35 should be extended 2,000 feet to the south (to 8,000 feet in length).

An extension of Runway 17/35 would also require the following additional work:

- Extend parallel taxiway system;
- Extend MIRLs;
- Extend medium intensity taxiway lights;
- Relocated REILs;
- Runway distance remaining signs; and
- Runway and taxiway marking.

6.10.2 Airfield Capacity Enhancement

A new 9,000-foot long x 100-foot wide Runway 4L/22R is recommended to be constructed by approximately the year 2016 (or when 80 percent ASV is reached) in order to meet the demands generated by the closure of Coronado Airport and/or the transfer of aircraft from Albuquerque International Sunport, as shown on Figure 6.6.

Construction of a parallel Runway 4L/22R would also require the following:

- New parallel taxiway system with entrance/exit taxiways;
- HIRLs;
- Medium intensity taxiway lights;
- PAPIs;
- REILs;
- Lighted wind cones;
- Runway distance remaining signs;
- Taxiway and hold line signs; and
- Runway and taxiway marking.

6.10.3 Crosswind Runway

A secondary crosswind runway is recommended for Double Eagle II Airport to provide safe operations during high velocity westerly winds when crosswinds on Runways 4/22 and 17/35 exceed 12 miles per hour. The current constraint on operations by small airplanes during afternoon periods, when winds are frequently from the west at more than 15 miles per hour, will not allow attainment of the runway capacities calculated in Section 6.3.

As discussed in Section 6.2, it is recommended that the crosswind runway be aligned in a 115/295-degree true heading (104/284-degree magnetic heading) correlating with a runway designation of 10/28. This is the optimum single runway orientation with the highest wind coverage on an all-weather basis from January to June (shown on Figure 6.4). It is recommended that the crosswind runway be designed to an ultimate length of 7,500 feet, serving the crosswind-susceptible light aircraft at Double Eagle II Airport.

Construction of a new Runway 10/28 would require the following:

- New parallel taxiway system with entrance/exit taxiways;
- HIRLs;
- Medium intensity taxiway lights;

- PAPIs;
- REILs;
- Lighted wind cones;
- Runway distance remaining signs;
- Taxiway and hold line signs; and
- Runway and taxiway marking.

6.10.4 Operational Control Requirements

As discussed in Section 6.7, it is recommended that Double Eagle II Airport provide an Air Traffic Control Tower to enhance safety at the airport. The City of Albuquerque has enrolled in the FAA Contact Tower Program to provide these services.

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